We claim:

1. A multi-pole high speed generator comprising a stator and a rotor, comprising:

a shaft having an axial bore with at least one orifice at each of a first and second end thereof;

a rotor assembly mounted on the shaft, the rotor assembly including a rotor having a plurality of poles and at least one support wedge positioned between each of the poles, each of the at least one support wedge having at least one supply port in each end open to at least one axial channel in the at least one support wedge; and

an end cap mounted on the rotor at opposite ends thereof, each of the end caps having means for restraining the at least one support wedge from radially outward movement and means extending from the at least one orifice at each of the first and second ends of the shaft for circulating a cooling medium between the shaft and the at least one support wedge to cool the rotor assembly during operation of the multi-pole high speed generator.

2. The multi-pole high speed generator of Claim 1, wherein the end caps define an end wall portion circumferentially surrounded by an annular flange.

3. The multi-pole high speed generator of Claim 2, wherein the means for restraining the at least one support wedge comprise the annular flange.

4. The multi-pole high speed generator of Claim 1, wherein the end caps include a plurality of radially circumferentially spaced openings around a peripheral raised edge of the end caps to selectively receive weights therein for balancing the rotor.

5. The multi-pole high speed generator of Claim 2, wherein each of the end caps include an end cap bore substantially in the center of the end wall portion.

6. The multi-pole high speed generator of Claim 5, wherein the end cap bore and the annular flange are shrunk fit respectively around the shaft and over the axial ends of the at least one support wedge, the end caps sealing the rotor ends and restraining the at least one support wedge on the rotor.

7. The multi-pole high speed generator of Claim 6, wherein the means extending from the at least one orifice in each of the first and second ends of the shaft include an annulus and at least one radial cooling medium gallery in the end caps that extends from the annulus to at least one supply port in the at least one support wedge.

8. A multi-pole high speed generator, comprising:

a shaft having an axial bore with at least one orifice extending radially from said bore at each of a first and second end thereof;

a rotor mounted on the shaft, the rotor having a plurality of poles and at least one support wedge positioned between each of the poles, the at least one support wedge having at least one inlet supply port and at least one outlet supply port open to at least one axial channel in the at least one support wedge;

a first end cap disposed over a first axial end of the at least one support wedge and having radial cooling medium galleries extending from the at least one orifice at the second end of the shaft through which the cooling medium exits the shaft to the at least one inlet supply port in each of the at least one support wedge and a second end cap disposed over a second axial end of the at least one support wedge and having radial cooling medium galleries extending from the at least one outlet supply port in the at least one support wedge receiving the cooling medium to the at least one orifice at the first end of the shaft through which the cooling medium enters the shaft before exiting the rotor.

9. An end cap for a multi-pole high speed generator having a rotor assembly with a plurality of poles and support wedges therebetween, the end cap comprising:

a substantially central bore;

a substantially circular end wall circumferentially surrounded by an annular flange; and

paired end cap openings in the end wall with each pair at 90° angles to one another;

10. The end cap for a multi-pole high speed generator of Claim 9, wherein the paired end cap openings are arranged circumferentially in the end wall.

11. The end cap for a multi-pole high speed generator of Claim 10, wherein the end wall further includes a cooling medium feed port between the openings in each pair of paired end cap openings.

12. The end cap for a multi-pole high speed generator of Claim 9, wherein the paired end cap openings are arranged along the same radial line in the end wall and at least one of the openings in each pair serves as a cooling medium feed port.

13. The end cap for a multi-pole high speed generator of Claim 9, wherein the end cap includes a raised peripheral edge having a plurality of circumferentially spaced openings provided therein for selective insertion of weights to help balance the generator.

14. The end cap for a multi-pole high speed generator of Claim 9, wherein the end cap further includes a manifold at a hub location on the interior of the end cap.

15. The end cap for a multi-pole high speed generator of Claim 9, wherein the bore and the annular flange are shrunk fit respectively around a shaft of a rotor of the rotor assembly and over the axial ends of the support wedges.

16. The end cap for a multi-pole high speed generator of Claim 15, wherein the manifold includes an annulus and at least one radial cooling medium gallery extending therefrom to at least one support port in the support wedges.

17. A method of cooling a multi-pole high speed generator having an axially bored shaft, a rotor mounted on the axially bored shaft having a plurality of poles and at least one support wedge positioned between each of the poles, comprising the steps of:

Transferring a cooling medium from a first end of the shaft to a second end of the shaft;

Transferring the cooling medium from at least one radially extending orifice in the shaft through one or more radial cooling medium galleries in an end cap at a second end of the rotor and through at least one axial channel in each of the at least one support wedge; and

Returning the cooling medium from the at least one support wedge through one or more radial cooling medium galleries in the second end cap to a second radially extending orifice on the shaft to exit out the first end of the shaft.

18. A method of assembling a balanced high speed generator rotor having a plurality of poles and at least one support wedge mounted between each of the poles comprising the steps of:

Placing an end cap over each end of a rotor body;

Centering a bore in each of the end caps around a shaft that extends axially through the rotor body;

Centering at least one support wedge under the inside of each end cap;

Aligning a plurality of paired openings in the end caps with a plurality of paired openings in each end of each of the at least one support wedge;

Shrink fitting the end cap over each end of the rotor body by shrink fitting the bore around the shaft and the axial ends of the at least one support wedge under each end cap;

Inserting an axial screw through each one of the openings of the plurality of paired openings in the end caps to be received in the aligned paired openings in each end of the at least one support wedge;

Testing the rotor on a balance machine; and

Selectively inserting as required weight into at least one of a plurality of circumferentially spaced openings in the raised peripheral edge of each end cap to balance the rotor.